

WHAT IS CLAIMED IS:

- 1 1. In a digital signal processor (DSP), a method for motion detection
2 in a current frame of video information, comprising:
3 providing a search window which defines a search area of data points of
4 said current frame, said search window defining a pattern of search points located in said
5 current frame;
6 loading a reference block into a first memory portion of said DSP;
7 loading at least a first frame portion of said search area into a second
8 memory portion of said DSP, said first frame portion including at least some of said
9 search points;
10 determining a first level search point including performing comparisons of
11 said reference block with search points in said first frame portion;
12 selectively loading a second frame portion of said search area into a third
13 memory portion of said DSP based on a location of said first level search point; and
14 performing a local search relative to said first level search point.
- 1 2. The method of claim 1 wherein said determining further includes
2 performing a comparison of said reference block with at least one search point that is
3 stored in a memory that is external to said DSP.
- 1 3. The method of claim 1 wherein said local search includes
2 providing a second search window centered about said first level search point, said
3 second search window defining a refined search area contained within said search area of
4 said current frame.
- 1 4. The method of claim 3 wherein said loading a second frame
2 portion is performed if said refined search area includes data points not contained in said
3 first frame portion.
- 1 5. The method of claim 1 wherein the first, second, and third memory
2 portions are portions of an on-chip memory of said DSP.
- 1 6. The method of claim 1 wherein said third memory portion is
2 contained within said second memory portion.

1 7. The method of claim 1 wherein said performing comparisons
2 includes producing motion vectors.

1 8. The method of claim 7 wherein said first level search point is
2 determined based on said motion vectors.

1 9. The method of claim 1 wherein said performing comparisons
2 include calculating sum of absolute difference values.

1 10. The method of claim 1 wherein the entirety of said search area is
2 loaded into said second memory portion.

1 11. A method for video compression by comparing a first frame of
2 video information against a second frame of video information, comprising:
3 identifying a reference frame contained in said first frame;
4 storing said second frame in a first memory;
5 defining a search area in said second frame, said search area comprising
6 data points in said second frame, said search area including plural search points;
7 storing at least a portion of said search area into a second memory,
8 including one or more of said search points;
9 comparing said reference block to search points contained in said second
10 memory;
11 determining a first level search point based at least on said step of
12 comparing;
13 defining a refined search area centered about said first level search point,
14 said refined search area being contained in said search area; and
15 performing a local search on said refined search area.

1 12. The method of claim 11 wherein said performing a local search
2 includes selectively loading data comprising said refined search area into said second
3 memory.

1 13. The method of claim 12 wherein said step of selectively loading
2 data is performed if said refined search area includes locations not contained in said first
3 frame portion.

1 14. The method of claim 11 further including an additional step of
2 comparing said reference block to search points which are contained in said first memory
3 and which are not contained in said second memory, said determining further based on
4 said additional step of comparing.

1 15. The method of claim 11 wherein said steps are performed in a
2 digital signal processor.

1 16. The method of claim 15 wherein said first memory is external to
2 said digital signal processor and said second memory is an on-chip memory contained in
3 said digital signal processor.

1 17. The method of claim 11 wherein said comparing includes
2 producing motions vectors and said first level search point is determined based on said
3 motion vectors.

1 18. The method of claim 11 wherein said comparing includes
2 calculating sum of absolute difference values.

1 19. The method of claim 11 wherein the entirety of said search area is
2 stored in said second memory.

1 20. In a digital video image compression system, a device for
2 estimating motion, comprising:
3 a processor;
4 a first memory coupled to said processor for storing a current frame; and
5 a second memory coupled to said processor, wherein said second memory
6 stores a sequence of instructions which, when executed by said processor, cause said
7 processor to perform steps of:

8 (i) accessing a search window which defines a search area in said current
9 frame, said search window defining a pattern of search points in said current frame;

10 (ii) loading a reference block into a first memory portion of said DSP;

11 (iii) loading at least a first frame portion of said search area into a second
12 memory portion of said DSP, said first frame portion including at least some of said
13 search points;

14 (iv) determining a first level search point including performing
15 comparisons of said reference block with search points in said first frame portion;
16 (v) selectively loading a second frame portion of said search area into a
17 third memory portion of said DSP based on the location of said first level search point;
18 and
19 (vi) performing a local search about said first level search point.

1 21. The device of claim 20 said first memory is external to said DSP.

1 22. The device of claim 21 said second memory is on-chip memory
2 contained in said DSP.

1 23. The device of claim 20 wherein said step (iv) further includes
2 performing a comparison of said reference block with at least one search point that is
3 stored in said first memory.

1 24. The device of claim 23 said first memory is external to said DSP.

1 25. The device of claim 20 wherein said performing comparisons
2 includes producing motion vectors and said first level search point is determined based on
3 said motion vectors.